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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,798	08/10/2005	Lin Xiang Sun	0299568-0420-PCT-US	9959

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SCHNADER HARRISON SEGAL & LEWIS, LLP
1600 MARKET STREET
SUITE 3600
PHILADELPHIA, PA 19103

EXAMINER	
SCHEUERMANN, DAVID W	

ART UNIT	PAPER NUMBER
2834	

MAIL DATE	DELIVERY MODE
12/17/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/520,798	SUN ET AL.	
	Examiner	Art Unit	
	DAVID W. SCHEUERMANN	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 June 2008* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) *4-7,10 and 24-27* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,8-9, 11-23 and 28-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10/6/2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *10/08* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

ELECTION/ RESTRICTION

Applicant's election with traverse of Group I, in the replies filed on 6/6/2008 and 4/14/2008 is acknowledged. Although claim 1 may now be generic and read on all embodiments withdrawn claim claims 4-7, 10 and 24-27 are not being considered at this time. These claims will be rejoined should they require all the limitations of an allowable claim. When *all* claims to the nonelected invention(s) depend from or otherwise require all the limitations of an allowable claim, applicant will be advised that claims drawn to the nonelected invention have be rejoined and the restriction requirement will be withdrawn. Presently, with amendment filed on 10/6/2008 only claims 1, 2, 3, 8-9, 11-23 and 28-33 read on the elected species of Group I.

The restriction requirement is still deemed proper and is therefore maintained.

Drawings

The replacement drawings filed on 10/6/2008 are approved by the examiner.

Response to Arguments

Applicant's arguments filed 10/6/2008 have been fully considered but they are not persuasive. Applicant asserts that, " Imlach discloses a passive magnetic bearing system in order to support a rotor in a stable position in X, Y & Z axis concurrently. The system comprises directly opposing permanent magnets 244 (on a rotor 24) and 224

(on a stator 22), and an offset magnet 246 on the rotor 22. By combining the directly opposing 244 and offset 246 magnets in the rotor (see Figure 2a), their interaction with the stationary magnet 224 can be combined (see column 3, lines17-37), thereby creating a first magnetic circuit in repulsion and a second magnetic circuit in attraction for stabilizing the system in respect to both radial and tilt displacements." While the examiner does not disagree with this assertion the limitations of "a flux path" or "a magnetic air gap" does not preclude the possibility of multiple air gaps of flux paths as demonstrated by Imlach, US 5894181. Furthermore, the limitation of "a magnetic air gap," emphasis added, does not exclude the possibility of either 1: two or more air gaps or 2: a single air pap of varied dimensions across the gap.

Applicant further asserts that, " Imlach fails to recite a device supplying additional force enhancement to a bearing system along the axis of rotation thereof by creating one flux path, either repulsive or attractive, as recited in amended independent claims 1 and 20." The Examiner disagrees with this assertion because magnet 244 of inherently generates flux lines as any magnet would which supply balancing force. Furthermore, in column 3, lines 5-40, Imlach, US 5894181 provides for repulsive or attractive configurations and the addition of additional offset magnets. Thus, this arguement is not persuasive.

Applicant further asserts that:

Tanaka et al. discloses using magnets and housings configures in a way to prevent damage to a permanent magnet bearing, by applying a smaller gap

between the magnet's housing than the gap that exists between the permanent magnets, thereby preventing the solid magnet materials to touch or magnetic foreign materials to become trapped in the gap. Tanaka et al. shows a first magnet 44 and a second magnet 41 of a smaller outer diameter (see Figure 1), the top surface of the top surface 44a of the larger magnet 44 is housed lower than the top surface of a case 45. As a result, there is more than one air gaps: i) air gap between the first magnet 44 and the second magnet 41, shown as B in Figure 2; ii) air gap between the case 45 (bottom element in Figure 2, holding the magnet 44) and the case 37 (holding the magnet 41) and shown as A in Figure 2.

The Examiner disagrees with this assertion because, again, claiming "said air gap," emphasis added, does not exclude the possibility of two air gaps or a single air gap of varied dimensions. Furthermore the arrangement in figure 1 of Tanaka et al., JP 404078315A is substantially similar to that of applicants elected specie I, i.e., figure 1.

Applicant further asserts that:

Claims 8, 9, 28 and 29 have been rejected as being unpatentable over Imlach in view of Ono et al. under 35 U.S.C. § 103, first paragraph. Applicants respectfully traverse the rejection as follows. Applicants has amended independent claims 1 and 20 to ore precisely recite what they believe the invention is, as supported by the application as filed. None of Imlach or Ono et

al., alone or in combination, teaches or even hints at a device and method as recited.

Claims 13, 14, 31 and 32 have been rejected as being unpatentable over Imlach in view of Johnson et al. under 35 U.S.C. § 103, first paragraph. Applicants respectfully traverse the rejection as follows. None of Imlach or Johnson et al., alone or in combination, teaches or even hints at a device and method as recited.

Claim 11 has been rejected as being unpatentable over Imlach in view of Guy and Thomas under 35 U.S.C. § 103, first paragraph. Applicants respectfully traverse the rejection as follows. None of Imlach or Guy or Thomas, alone or in combination, teaches or even hints at a device and method as recited.

These traversals as not specific. They are just broad generalizations, hence these arguments are not persuasive.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 12, 16-18, 20-22 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Imlach, US 5894181. Imlach, US 5894181 shows:

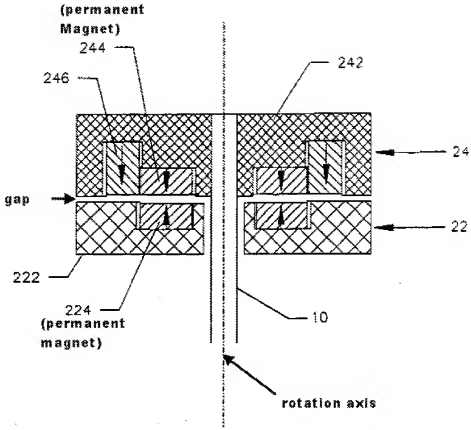
A thrust load enhancement device for a rotor-bearing system, comprising

a stator 22 mounted on a rotation axis of the rotor-bearing system;

a rotor 24 mounted on the rotation axis of the rotor-bearing system and separated from said stator by a magnetic air gap on the rotation axis; and

at least one permanent magnet 244 mounted on the rotation axis of the rotor bearing system (see figure 2a labeled below)

wherein said at least one permanent magnet is fixed to a first on of : i) said stator and ii) said rotor, and is separated from a second one of : i) said stator and ii) said rotor by said magnetic air gap; said at least one permanent magnet, said stator and said rotor form a magnetic circuit characterized by a flux path, said air gap being adjustable, (see axial force vs. displacement figure 2b) a flux in said air gap generating a compensation force between said rotor and said stator that opposes an external force Fext. (inherent since the gap remain substantially constant)



Re claims 2 and 21, note that shaft 10 of Imlach, US 5894181 is disposed in a vertical orientation therefor the effects of gravitational force is balanced.

Re claims 3 and 22, note permanent magnet 224, supra.

Claims 12, 16, 17, 18 and 30 recite are limitations related to intended use of the device with no additional structural apparatus limitations or characterizations recited of the device itself. Furthermore, Imlach, US 5894181 shows the rotor being supported in a vertical orientations thus acting against shaft weight.

Claims 1, 20 and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanaka et al., JP 404078315A. Tanaka et al., JP 404078315A shows:

A thrust load enhancement device for a rotor-bearing system, comprising

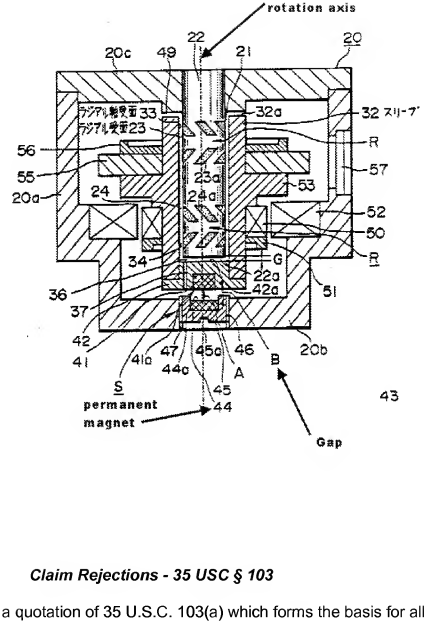
a stator 45A mounted on a rotation axis of the rotor-bearing system;

a rotor 42A mounted on the rotation axis of the rotor-bearing system and separated from said stator by a magnetic air gap on the rotation axis; and

at least one permanent magnet 44 mounted on the rotation axis of the rotor bearing system (see figure 1 labeled below)

wherein said at least one permanent magnet is fixed to a first on of : i) said stator and ii) said rotor, and is separated from a second one of : i) said stator and ii) said rotor by said magnetic air gap; said at least one permanent magnet, said stator and said rotor form a magnetic circuit characterized by a flux path, said air gap being adjustable, (see groove 45 for screwdriver to adjust the vertical direction of case 45 as described on page 8 of the translation.) a flux in said air gap generating a compensation force between said rotor and said stator that opposes an external force Fext. (inherent since the gap remain substantially constant)

Re claim 33, note hydrodynamic bearing system comprising 23a and 24a.



Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 8, 9, 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imlach, US 5894181 in view of ONO ET AL., US 5360470. Imlach, US 5894181 discloses the invention substantially as claimed as set forth in the rejection of claim 1, supra. Imlach, US 5894181 does not expressly disclose, "...further comprising a spacer to adjust said first and second magnetic air gaps." or "... further comprising a piezoelectric actuator mounted in said stator." ONO ET AL., US 5360470 discloses use of a piezoelectric spacer 70p, for the purpose of adjusting the magnetic gap to ensure efficient operation. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to include an adjustable piezoelectric spacer on the device of Imlach, US 5894181 as taught by ONO ET AL., US 5360470. One of ordinary skill in the art would have been motivated to do this to maintain the efficient operation of the device.

Claims 13, 14, 31, 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imlach, US 5894181 in view of JOHNSON ET AL., US 5291975. Imlach, US 5894181 discloses the invention substantially as claimed as set forth in the rejection of claim 1, supra. Imlach, US 5894181 does not expressly disclose, "...further comprising force measurement devices to measure the compensation force." or "...wherein said force measurement devices are selected from the group consisting of strain gauges and piezoelectric elements." JOHNSON ET AL., US 5291975 discloses use of a piezoelectric force sensor to control a magnetic bearing, for the purpose of damping vibrations. At the time the invention was made, it would have been obvious to a person

of ordinary skill in the art to employ piezoelectric force sensor in the device of Imlach, US 5894181. One of ordinary skill in the art would have been motivated to do this to dampen vibrations.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Imlach, US 5894181 in view of GUY, CN 1120256A and THOMAS, US 2782354. Imlach, US 5894181 discloses the invention substantially as claimed as set forth in the rejection of claim 1, supra. Imlach, US 5894181 does not expressly disclose, "...wherein said rotor is made of carbon steel and said stator is made of mild steel." GUY, CN 1120256A and THOMAS, US 2782354 disclose, respectively the use of a rotor made of carbon steel to reduce costs and use of a mild steel stator to avoid flux crossing laminations see column 2, lines 9-14. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to choose a suitable and desired material, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. See *In Re Leshin*, 125 USPQ 416. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use a rotor of carbon steel and a stator of mild steel in the device of Imlach, US 5894181. One of ordinary skill in the art would have been motivated to do this to reduce manufacturing costs and reduce reluctance in the magnetic path.

Conclusion

Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David W. Scheuermann whose telephone number is (571) 272-2035.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Quyen Leung can be reached at (571) 272-8188. The fax phone numbers for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/D. W. S./
Examiner, Art Unit 2834
December 17, 2008

/Karl I.E. Tamai/
Primary Examiner, Art Unit 2834